8

AQIM Handbook

Northern Border Truck Cargo

Contents

Background

In order to properly monitor cargo, you need to have a good understanding of two key statistical principles:

1. It is important that the sample selected be representative of the universe. Random selection helps ensure this.
2. Once the sample is selected, it is necessary to inspect the sample thoroughly.

If you want your work location to produce quality risk information, then each person participating must have a clear understanding of the sampling universe, cargo strata and stratifying the sample, the unit of sampling, and consistency issues.

The Sampling Universe

You estimate the number and kinds of pests or improperly manifested items in a cargo entry pathway by taking a random sample from the universe of all cargo in the pathway. It is key to good statistics to carefully define this universe from which you want to draw your random sample. The following questions need answers in order to be able to select the sample correctly and make statistical inferences for the entire universe.

- How are commodities transported?
- How many commodities are arriving at a work location?

- What kinds of commodities are arriving?
- Are certain types of commodities of more interest to PPQ than others?

For AQIM, the universe is defined by the mode of transport of the cargo such as truck. Initially, PPQ has decided to limit the universe. The following commodities or commodity types will be **excluded** from the sampling universe:

- Commodities which are pre-cleared at foreign sites;
- Frozen commodities;
- Commodities which undergo some type of mandatory treatment, other than cold treatment (for example, fumigation, irradiation, hot water treatment) at work locations; and
- Oil, salt, iron ore, coal, etc., which have no pest risk.

Cargo Strata and Stratifying the Sample

The survey processes for AQIM were designed to be compatible with PPQ cargo inspection groupings. The surveys divide the cargo universe into several homogeneous and distinctly separate groups, in order to estimate the pest approach rates in each group.

By sampling a set number of samples from each cargo group, PPQ is able to get precise estimates of cargo containers with pests. It is then easier to make comparisons, which help the work location understand how effectively it manages the pest risk for cargo strata, as well as for the cargo universe

It is very important that each sample selected be representative of all other units in the stratum being sampled. One way to ensure that the sample is representative is to choose a truck at random (either random time, or random number). This random selection process eliminates the bias of the Agriculture Specialist selecting the sample. The Agriculture Specialist's experience (bias) might lead to choosing a truck that is carrying a commodity that is more likely to be harboring a pest. This bias would make the sample not represent the entire stratum of trucks. The monitoring results would be skewed toward those commodities likely to harbor a pest. This kind of bias would hamper the work location's ability to make the best decisions based on risk analysis.

What is Not Part of the Sampling Universe

For the time being, pre-cleared cargo will continue to be left out of the sampling universe for all categories. Also, frozen commodities and commodities that undergo mandatory treatments at work locations, other than cold treatment, are left out of the sampling universe for now. Other bulk commodities, such as, oil, iron ore, salt, and coal, that have no possibility of pest risk associated with them are also not part of the sampling universe.

Setting Up a Process

Setting up a process of selecting representative samples in each group will be one of the biggest challenges in AQIM. Because each work location has its own unique set of circumstances in cargo operations, the work location must individualize its random sampling process. It will be necessary to document the process and ask for feedback from other work locations and headquarters staff who have experience in selecting random samples in the cargo environment. Work locations may even decide that this particular part of the monitoring is important enough to form a Northern Border Risk Management Team to review the random sampling process on a regular basis.

The Unit of Sampling

For Northern border truck cargo, the sample unit is a truck box, not including the cab. It is crucial that the sample unit is inspected closely enough to detect any actionable pests or improperly manifested items. Summary inspection procedures for Northern border truck cargo begin on page 8-5. The procedures must be followed exactly in order for the monitoring estimates to be valid, and useful.

Consistency of Data Collection

It is crucial that the monitoring results from the inspection of a random sample unit are recorded accurately and consistently. Because each sample represents many other units, all Agriculture Specialists must be as consistent as possible in following the inspection procedures.

The group containing regulated commodities pose a special challenge. If the sample selected is a regulated commodity, it is important to understand the following:

Cargo monitoring estimates the number of trucks approaching the work location with pest infestation levels requiring action by PPQ. AQIM uses risk-based inspectional procedures for detecting 10

percent pest infestation rate. This initial threshold is used to estimate the number of trucks approaching a work location and to mitigate a pest threat.

NOTICE

This 10 percent infestation level may change as the data for AQIM is collected and analyzed.

To be 95 percent sure that the Agriculture Specialist inspecting the sample truck will find the pest, when the shipment is infested at a 10 percent infestation level, the Agriculture Specialist must select, at random, a specific number of boxes in the shipment. Determine this number of boxes by using the hypergeometric table illustrated in Table 8-1. Each of these boxes must be inspected at a level of intensity to ensure that:

- No hitchhiker pests are present in the box,
- No internal feeding insects are present in randomly selected fruit in the box, and
- No mismanifested or smuggled items are present.

TABLE 8-1: Hypergeometric Table For Random Sampling

Total number of boxes on the truck:	Randomly Select This Number of Boxes to Inspect:
1-10	10
11-12	11
13	12
14-15	13
16-17	14
18-19	15
20-22	16
23-25	17
26-28	18
29-32	19
33-38	20
39-44	21
45-53	22
54-65	23
66-82	24
83-108	25
109-157	26
158-271	27
272-885	28
886-200,000	29

Agriculture Specialists should follow normal inspectional procedures of fruits or vegetables to make these determinations. For example, fruit should be cut to detect for internal feeders if external evidence is present.

AQIM provides information about the relative risk of various entry pathways. To do this, the AQIM activities will follow a qualitative risk assessment model. The survey analysts will "plug into the model" the estimated number of specific actionable pests identified in the samples. Therefore, when a regulated sample shipment is being inspected for AQIM, the Agriculture Specialist needs to inspect every box required by the hypergeometric table. The number of pest specimens that are actually observed should be recorded on PPQ Form 309, Pest Interception Record.

For the relative pathway risk model to be useful, monitoring at all work locations must report the number of pest specimens accurately and consistently. It is necessary to follow the inspection guidelines, sampling processes, User Guides, and sampling protocols.

Northern Border–Truck Cargo Procedures Summary

Figure 8-1 lists the individual ports that conduct AQIM for the Northern Border truck cargo during FY 06..

Port Name	State
Alex Bay	NY
Blaine	WA
Detroit	MI
Port Huron	MI
Rouses Pt./Champlain	NY

FIGURE 8-1: FY06 Ports Participating in AQIM for the Northern Border Truck Pathway

The survey processes provide the sample sizes for each work location monitoring the pathway strata. The following is a summary of the stratified sample design and sizes in Northern border truck cargo:

Northern Border Truck Cargo	
Commodity	**Commercial Plant Perishable Agricultural Cargo** (This category is defined as any commercial formal or informal entry of fresh fruit, vegetables, plants or other non-processed or not refined plant product that is perishable. **Reefer Equipped Containers (includes whether the reefer unit is running or not)**
Sample Size	For **Commercial Plant Perishable Agricultural Cargo,** select six (6) trucks per week per port. (This excludes Brass released cargo and mandatory treatment cargo.) For **Reefer Equipped Containers (Includes whether reefer unit is running or not),** select six (6) random samples per week per port for checking compliance.
Inspection Methodology	For **Commercial Perishable Agricultural Cargo**: 1. Inspect cargo using appropriate AQIM hyper geometric inspection procedures for each sample. 2. Record all needed data on appropriate FY 2006 AQIM data worksheet For **Reefer Equipped Containers (Includes whether reefer unit is running or not)**: 1. This excludes the reefers of plant perishables already monitored in the above category. (Note: Inspection of this cargo can be predominantly tailgate, with occasional climb in or de-van, **as long as the inspection satisfies the inspector the cargo is what documents state**.) 2. Need to monitor primarily for smuggling of agricultural and other prohibited items. 3. Record all needed data on appropriate FY 2006 AQIM data worksheet

Pathway Monitoring Maintenance and Quality Assurrance

Port managers and local AQIM coordinators are responsible for ensuring that monitoring activities are being performed and being performed properly. To help with reviewing the status of monitoring activities, refer to **Appendix L—Introduction** This appendix contains a checklist of questions port managers and local AQIM coordinators should periodically answer to ensure proper monitoring of each designated pathway at their work locations. See **Figure E-1**

The questions review the following topics:

- Random sampling

- Proportional sampling
- Adequate sampling
- Accurate and complete data
- Working risk committees
- Local support

Northern Border–Truck Cargo Worksheets

There is are two worksheets for recording information gathered from the inspection of Northern border truck cargo for the purpose of AQIM. The worksheet for Reefer Truck Compliance checks is available at:

http://www.aphis.usda.gov/ppq/manuals/port/pdf_files/AQIM_in_PDF/Northern_Border_CargoRfrTrk.pdf

The worksheet for Perishable cargo is available at:

http://www.aphis.usda.gov/ppq/manuals/port/pdf_files/AQIM_in_PDF/Northern_Border_Cargo_perishables.pdf

Data Collection using Agriculture Quarantine Activity System (AQAS)

For detailed instructions on data collection, access the AQAS Users Guide at the following address:

https://mokcs14.aphis.usda.gov/aqas/login.jsp

Survey Results and How To Use Them

AQIM activities have been put into place to develop baseline data to help answer two basic questions:

1. What is the threat of agricultural pests approaching work locations?
2. How effective is the AQI program at managing this threat?

Results of surveys for Norther border truck cargo provided a general answer for question 1. There are varying rates at which prohibited agricultural materials and pests approach the work locations. These prohibited agricultural materials are what can have agricultural pests.

Further analysis of the monitoring data is needed to determine the risk associated with the prohibited items approaching the work location. The origin and destination of the prohibited items is important to determine risk levels. Also, whether or not the prohibited item carries an actual agricultural pest is crucial in analyzing risk.

Analyses of the monitoring data need to occur at several levels of PPQ. At the work locations, PPQ personnel need to study what the data means and answer the first question for their specific work location. Analysis tools are available to help with these analyses, which are explained in the next subsection. At the same time, PPQ holds risk analysis workshops around the country to introduce risk analysis concepts. At some work locations, teams of PPQ officers and managers form Risk Management Teams to look at monitoring data and other data, which are normally collected at the work location.

At other locations, analyses of monitoring data occur to establish the rates at which quarantined items and agricultural pests are approaching the borders of States, areas of the country, and the United States.

Once baseline rates are well established, PPQ can use the monitoring data as a baseline to answer the second basic question: How effective is the AQI program at managing the risk of introduction of agricultural pests and diseases? Again, each work location must conduct this type of analysis. AQIM provides a framework which work location can use to carry out the analysis.

Questions To Guide Data Analysis

1. How many trucks were selected for sampling during the survey period?

   How many actions were required on the trucks sampled?

   How many actions by strata category sampled were there? (Previous data has multiple strata.)

   What is the action approach rate of trucks that require action (number of trucks requiring action divided by total trucks in the sample)?

2. How many pest interceptions (actionable pests) were made from survey samples?

   Pest Approach Rate: What is the rate of pest interceptions in relation to the total sampled number of trucks (number of trucks with actionable pests divided by total trucks in the sample)?

3. Compare the rate of actions required for each month of the survey.

   DISCUSSION

   Are there easily identified trends when the rate of cargo actions transiting the work location are higher?

   Are there seasonal trends?

   Do higher rates correlate with national or religious holidays, certain types of trucks, cargo, or importers?

4. Generate a listing and frequency of shipments requiring action. Which commodities present the greater risk?